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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,216	12/03/2003	Yong-Kyu Jang	8054-27 (LW8079US/WS).	5421

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EXAMINER	
DOLAN, JENNIFER M	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,216	JANG ET AL.	
	Examiner	Art Unit	
	Jennifer M. Dolan	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,8,11-26,28,29,34-39,41,43,45,47-62,64-68 and 70-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-3,5,8,11-26,28,29,34-39,41,43,45,47-62,64-68 and 70-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 February 2006 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-3, 5, 8, 11-23, 37-39, 41, 43, 45, 47-59, and 75-78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 37, and 75 recite the limitations of a second electrode electrically connected to the first electrode in at least two locations in the window. The Applicant's disclosure, however, indicates one contiguous contact between the electrodes within the window, wherein the contact is formed along the periphery of the window (see figure 3), and wherein the contact appears only in two discrete locations in a cross sectional view (figure 2). Since the Applicant's contact is a contiguous ring, rather than being two discrete contacts, and since there is no textual support in the disclosure of the "two locations", it is unclear exactly how large a single, contiguous contact

must be in order to span the claimed "at least two locations," or what, exactly, is meant by a single contact being provided at two locations.

For the purpose of examination, it is assumed that the second electrode is contacted to the first electrode within the window along the periphery of the window.

Regarding claims 75-78, the claims recite that the first and second electrodes are formed on an insulating layer overlying the thin film transistor (assumed to be comparable to the figures 8-12 embodiments in the specification), but that the second electrode is provided on the first electrode in a window formed in the insulating layer, where the antecedent basis of the "insulating layer" must refer back to the insulating layer disposed underlying both of the electrodes. Thus, it is unclear exactly how the claimed liquid crystal device is configured.

For the purpose of examination, it is assumed that the second electrode is provided on the first electrode in at least two locations within a window formed in a *second insulating layer.*

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 11, 12, 15, 23, 37-39, 45, 47, 48, 51, 59, 67, 68, 71, and 72 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No 2003/0067570 to Okamoto et al.

Regarding claims 1 and 37, Okamoto discloses a liquid crystal display device (figures 23-28) comprising: a first substrate (29) including a TFT (21) formed thereon (figure 24); a first electrode (20) formed on the first substrate and electrically connected to the TFT (connected through 22, see paragraph 0437); a first insulating layer (25) formed on the first substrate including the TFT and the first electrode (figure 4), the first insulating layer having a window (opening at transmission display region 10) to expose a portion of the first electrode (see figure 24); a second electrode (19) formed on the first insulating layer and electrically connected to the first electrode (paragraphs 0436-0437) within the window along the periphery of the window (see figures 23, 24, and 28), the second electrode having an opening (see figure 24) to expose the predetermined region of the first electrode, the window; a second substrate (62) including a third electrode (502) thereon (figure 27); a first gap between the surface of the third electrode and the predetermined region of the first electrode (see figure 27 – gap between electrode portion 20 and electrode 502 in the transmission region 10); and a second gap between the third electrode and the second electrode (figure 27 – gap between top of 19 and electrode 502 in reflection display region 9), wherein the gaps include a liquid crystal layer (1).

Regarding claims 2, 3, 38, and 39, Okamoto discloses that the first electrode is a transmission electrode for transmitting light supplied from a source internal to the device, and the second electrode is a reflection electrode for reflecting light supplied from a source external to the device (see paragraphs 0429-0431; figures 24 and 27).

Regarding claims 11, 12, 15, 47, 48, and 51, Okamoto discloses a gate driving circuit region and section (line 23 drives the gate of the TFT; see figures 23, 24, 28; paragraphs 0438-0439), wherein the insulating layer is absent only in the transmission display region (paragraphs 0436-0439; figures 23, 24), and wherein the gate driving line is not located in the transmission region (paragraph 0438), such that the insulating layer is present over the gate driving circuit (see figures 23-24).

Regarding claims 23 and 59, Okamoto discloses homogeneous alignment at a tilting angle of about zero degrees of the liquid crystal layer (see paragraphs 0205-0211).

Regarding claim 45, Okamoto discloses that the first conductive layer is made of ITO (paragraph 0436).

Regarding claims 67, 68, 71, and 72, Okamoto discloses that an end portion (portion of 19 contacting electrode 20) is formed on the first electrode exposed via the opening (figures 23 and 24), and wherein the window (region between insulating layer portions 25) is larger than the opening (region between bottom portions of 19; see figure 24).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 5, 19-22, 41, and 55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of U.S. Patent No. 6,847,426 to Fujimori et al.

Regarding claims 5 and 41, Okamoto fails to specify the relative gap dimensions.

Fujimori teaches that the first gap (D_T – figures 1 and 12) is about twice as long as the second gap (D_R – figures 1 and 12; column 7, lines 30-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the gap dimensions of Okamoto such that the first gap is twice as large as the second gap, and such that the dimensions are appropriately selected for maximum emission and contrast, as suggested by Fujimori. The rationale is as follows: A person having ordinary skill in the art would have been motivated to select a first gap that is twice as long as the second gap, because doing so ensures that the optical path length of both the reflection mode and the transmission mode are the same (Fujimori, column 15, lines 1-16), which prevents undesirable artifacts such as image displacement.

Regarding claims 19-22 and 55-58, Okamoto discloses that the second substrate includes a color filter layer (61) having a greater thickness in the transmission display region (corresponding to the window) than in the reflection display region (see figure 27).

Okamoto fails to specifically disclose a thickness adjusting member formed on the second substrate, such that the thickness of the color filter in the window region is about twice the thickness of the second area not corresponding to the window.

Fujimori teaches that the second substrate for an LCD (see figure 1) advantageously comprises a color filter layer (24), the color filter having a first thickness (d_T-see figure 1) in a first area corresponding to the transmission window of the LCD and a second thickness (d_R) less

than or about half of the first thickness (see column 7, lines 6-19; column 9, lines 50-65; column 14, lines 20-59; table 4) in a second area, corresponding to the second electrode/reflection region (see figure 1), wherein the different thicknesses are provided by a thickness adjusting member (22) that has been removed in the window portions (see figures 1, 12); and a third electrode (28) formed on the color filter layer (figures 1, 12) and bent in accordance with a difference between the first and second thicknesses (figures 1 and 12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LCD of Okamoto to include the color filter substrate taught by Fujimori. The rationale is as follows: A person having ordinary skill in the art would have been motivated to use the color filter substrate of Fujimori in order to improve the light utilization efficiency in the reflection region, as well as improve the color purity and brightness of the entire display (see Fujimori, column 3, lines 10-25).

8. Claims 8, 13, 14, 17, 18, 43, 49, 50, 53, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of U.S. Patent No. 6,295,109 to Kubo et al.

Regarding claims 8, 13, 43, and 49, Okamoto fails to disclose that the insulating layer is a photosensitive acryl resin having a thickness in the range of 0.5 microns-2.5 microns.

Kubo discloses that the insulating layer is a photosensitive acryl resin having a thickness of 2.5 microns (see column 49, lines 50-55; column 50, lines 10-20), where the photosensitive acryl resin has a lower dielectric constant than the liquid crystal layer measured in a parallel or perpendicular direction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LCD structure of Okamoto, such that the first insulating layer is a photosensitive acryl resin having a thickness of 2.5 microns, as taught by Kubo. The rationale is as follows: A person having ordinary skill in the art would have been motivated to use a photosensitive acryl resin, because doing so allows for the reflection irregularities to be directly patterned into the insulating layer, without the need for additional photoresist deposition and removal steps, thus decreasing the cost and complexity of fabrication, as is appreciated by one skilled in the art (also see Kubo, column 49, lines 49-55). Since Kubo shows that a photosensitive acryl resin having a thickness of 2.5 microns provides the advantage of enabling direct patterning of the insulating layer while retaining properties suitable for use as an LCD insulation layer, it is well within the purview of a person skilled in the art to select such materials.

Regarding claims 14, 17, 18, 50, 53, and 54, Okamoto discloses an LCD structure including a TFT having a gate layer (23), source and drain layers (22 and 28), and a layer between the two that is understood to be a gate oxide layer, where the gate oxide layer extends over the entire pixel array (see figure 24). Okamoto, however, does not specifically state that the layer overlying the gate line and provided under the transmission electrode (20) in the transmission display section is properly interpreted as an insulating layer.

Kubo shows a TFT structure substantially similar to that of Okamoto wherein a gate oxide layer (54, acting as the "second insulating layer") is provided on the first substrate, and includes a contact hole (portion 'at' item 66 of figure 29a), wherein the first electrode is connected to the TFT in the contact hole (see figure 29a). Since the gate oxide layer is only

removed at the transmission window, it extends into the gate driving circuit region and over gate lines 53 (also see column 55, lines 52-60),

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LCD of Okamoto by including a second insulating layer, as suggested by Kubo, such that the first electrode and TFT are connected through a contact hole in the second insulating layer, as further suggested by Kubo. The rationale is as follows: A person having ordinary skill in the art would recognize that a gate oxide layer must be present in a TFT in an LCD, as is illustrated by Kubo (see figure 29). Since Kubo further illustrates that the gate oxide layer can be used to control the point of connection between the source/drain electrode of the TFT and the transmission electrode of the pixel, thus preventing any shorting between electrodes or the TFT active region, a person skilled in the art would use the TFT structure taught in Kubo to provide the gate oxide layer and control the interconnections between the electrodes.

9. Claims 16 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of U.S. Patent Publication No. 2003/0071944 to Baek.

Okamoto fails to teach that the gate driving circuit region is formed from amorphous silicon.

Baek discloses that the gate driving circuit region is formed from amorphous silicon (paragraphs 0045-0048).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gate driving circuitry of Okamoto, such that the gate line structure includes amorphous silicon, as suggested by Baek. The rationale is as follows: A person having

ordinary skill in the art would have been motivated to include layers of amorphous Si in the gate line and gate driving circuitry, because doing so allows for good ohmic contacts between the metal gate lines and the semiconductor material of the TFT, while allowing for a reduction in the number of layer deposition steps and photolithography steps (see Baek, paragraphs 0016, 0020, 0027).

10. Claims 24-26, 28, 29, 34, 35, 60-62, 64, 65, 70, 73, and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,620,655 to Ha et al. in view of U.S. Patent No. 6,847,426 to Fujimori et al.

Regarding claims 24, 60, 70, 73, and 74, Ha discloses a liquid crystal display device (Figures 1, 2, 7a-7f) comprising: a first substrate (111) including a first thin film transistor (132, 133, 134, etc. fig. 7b); an insulating layer (151) formed on the substrate (figure 7c); a first electrode (119a) formed on the insulating layer and electrically connected to the TFT (through 153; see figure 7c); a second electrode (166, 168) provided on the first electrode (figure 7e), wherein a predetermined portion of the second electrode is removed (at transmission window 155) for exposing a predetermined portion of the first electrode (figure 7F); a second substrate (15) including a third electrode (13) formed thereon (column 1, lines 24-36; it is apparent that the device of figure 7f is only the array substrate for the LCD, and that the color filter substrate would need to be present for the device to function as an LCD); and first and second gaps between the third electrode and the first or second electrodes, respectively, where the gaps include liquid crystal material (see figures 2 and 7F; it is apparent that the liquid crystal is

disposed directly on the array substrate of figure 7F, with a color filter substrate disposed on top of the liquid crystal, as in figure 2; also see column 11, lines 50-55).

Ha fails to specifically disclose the structure of the second substrate comprising the color filter.

Fujimori teaches that the second substrate for an LCD (see figure 1) advantageously comprises a color filter layer (24), the color filter having a first thickness (d_T-see figure 1) in a first area corresponding to the transmission window of the LCD and a second thickness (dR) less than or about half of the first thickness (see column 7, lines 6-19; column 9, lines 50-65; column 14, lines 20-59; table 4) throughout a second area, corresponding to the second electrode/reflection region (see figure 1), wherein the different thicknesses are provided by a thickness adjusting member (22) that has been removed in the window portions (see figures 1, 12); and a third electrode (28) formed on the color filter layer (figures 1, 12) and bent in accordance with a difference between the first and second thicknesses (figures 1 and 12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LCD of Ha to include the color filter substrate taught by Fujimori. The rationale is as follows: A person having ordinary skill in the art would have been motivated to use the color filter substrate of Fujimori in order to improve the light utilization efficiency in the reflection region, as well as improve the color purity and brightness of the entire display (see Fujimori, column 3, lines 10-25)

Regarding claims 25, 26, 61, and 62, Ha discloses that the first electrode is a transmission electrode for transmitting internally supplied light, and the second electrode is a reflection

electrode for reflecting externally supplied light (see column 1, line 60 – column 2, line 12; column 10, line 65 – column 11, line 5; columns 30-45).

Regarding claims 28, 29, and 64, Ha fails to disclose the relative dimensions of the first and second gaps.

Fujimori teaches that the first gap (D_T – figures 1 and 12) is about twice as long as the second gap (D_R – figures 1 and 12; column 7, lines 30-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the gap dimensions of Ha such that the first gap is twice as large as the second gap, and such that the dimensions are appropriately selected for maximum emission and contrast, as suggested by Fujimori. The rationale is as follows: A person having ordinary skill in the art would have been motivated to select a first gap that is twice as long as the second gap, because doing so ensures that the optical path length of both the reflection mode and the transmission mode are the same (Fujimori, column 15, lines 1-16), which prevents undesirable artifacts such as image displacement. Although Ha and Fujimori fail to specifically teach a first gap of less than 3.3 microns and a second gap of less than 1.7 microns, it has been held that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

Regarding claim 34, Ha discloses a contact hole (153) formed in the insulating layer (figures 7c and 7d), wherein the first electrode is connected to the TFT through the contact hole (figures 7c, 7d).

Regarding claim 35, Ha discloses that the electrode surface of the contact hole is disposed at a level slightly higher than the first electrode, but lower than the second electrode, such that upon assembly of the two substrates, the second gap would be smaller than the third gap, which would be smaller than the first gap (see figures 7f and 2).

Regarding claim 65, Ha discloses a gate driving circuit (right-hand portion of substrate in figure 7f, including gate lines) on the substrate (see figure 7f).

11. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ha et al. in view of Fujimori et al. as applied to claim 24 above, and further in view of U.S. Patent No. 6,295,109 to Kubo et al.

Ha fails to specify the orientation of the liquid crystal layer.

Kubo teaches that the liquid crystal layer is homogeneously aligned with a tilting angle of about 0 degrees (see columns 20-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the liquid crystal layer of Ha, as modified by Fujimori, have an orientation of zero degrees, as suggested by Kubo. The rationale is as follows: A person having ordinary skill in the art would have been motivated to provide a tilting angle of 0 degrees, because Kubo shows that such an angle conveniently allows for a non-emitting display at no applied voltage, with the brightness of the display increasing with increased applied voltage, such that a grayscale display is formed (see Kubo, columns 20-23).

12. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ha et al. in view of Fujimori et al., as applied to claim 65, above, and further in view of Baek.

Ha fails to disclose that the gate driving circuit region is formed using amorphous silicon.

Baek discloses that the gate driving circuit region is formed from amorphous silicon (paragraphs 0045-0048).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gate driving circuitry of Ha as modified by Fujimori, such that the gate line structure includes amorphous silicon, as suggested by Baek. The rationale is as follows: A person having ordinary skill in the art would have been motivated to include layers of amorphous Si in the gate line and gate driving circuitry, because doing so allows for good ohmic contacts between the metal gate lines and the semiconductor material of the TFT, while allowing for a reduction in the number of layer deposition steps and photolithography steps (see Baek, paragraphs 0016, 0020, 0027).

13. Claims 75, 77, and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ha et al. in view of Okamoto et al.

Regarding claim 75, Ha discloses a liquid crystal display device (Figures 1, 2, 7a-7f) comprising: a first substrate (111) including a first thin film transistor (132, 133, 134, etc. fig. 7b); an insulating layer (151) formed on the substrate including the first TFT (figure 7c); a first electrode (119a) formed on the insulating layer and electrically connected to the TFT (through 153; see figure 7c); a second electrode (166, 168) provided on the first electrode (figure 7e), wherein a predetermined portion of the second electrode is removed (at transmission window

155) for exposing a predetermined portion of the first electrode (figure 7F); a gate driving circuit section (149, 125, etc.) formed on the first substrate (see figures 7a-7f) a second substrate (15) including a third electrode (13) formed thereon (column 1, lines 24-36; it is apparent that the device of figure 7f is only the array substrate for the LCD, and that the color filter substrate would need to be present for the device to function as an LCD); and first and second gaps between the third electrode and the first or second electrodes, respectively, where the gaps include liquid crystal material (see figures 2 and 7F; it is apparent that the liquid crystal is disposed directly on the array substrate of figure 7F, with a color filter substrate disposed on top of the liquid crystal, as in figure 2; also see column 11, lines 50-55).

Ha fails to disclose that the second electrode is provided on the first electrode in at least two locations within a window formed in the insulating layer.

Okamoto discloses a liquid crystal display wherein the second electrode (19) contacts the first electrode (20) in the window around the entire periphery of the window (see figures 23, 24; paragraphs 0436-0437).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the LCD structure of Ha, such that the second electrode extends into the window, contacting the first electrode within the window, as suggested by Okamoto. The rationale is as follows: A person having ordinary skill in the art would have been motivated to have the second electrode contact the first electrode within the contact window, because doing so provides a greater contact area between the two electrodes, thus decreasing contact resistance and providing a more secure contact, as is appreciated by a person skilled in the art.

Regarding claim 77, Ha discloses that the first insulating layer covers the gate driving circuit section (see figures 7a-7f).

Regarding claim 78, Ha discloses that the first insulating layer is a low-k organic layer (claim 12, lines 48-55; BCB and acryl-based resin are low-k organic layers), which has a dielectric constant lower than that of a liquid crystal layer.

14. Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ha et al. in view Okamoto, as applied to claim 75, supra, and further in view of Baek.

Ha fails to disclose that the gate driving circuit region is formed using amorphous silicon.

Baek discloses that the gate driving circuit region is formed from amorphous silicon (paragraphs 0045-0048).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gate driving circuitry of Ha as modified by Okamoto, such that the gate line structure includes amorphous silicon, as suggested by Baek. The rationale is as follows: A person having ordinary skill in the art would have been motivated to include layers of amorphous Si in the gate line and gate driving circuitry, because doing so allows for good ohmic contacts between the metal gate lines and the semiconductor material of the TFT, while allowing for a reduction in the number of layer deposition steps and photolithography steps (see Baek, paragraphs 0016, 0020, 0027).

Response to Arguments

15. Applicant's arguments with respect to claims 1-3, 5, 8, 11-26, 28, 29, 34-39, 41, 43, 44, 47-62, 64-68, and 70-78 have been considered but are moot in view of the new grounds of rejection.

The Examiner notes that although claims 24-26, 28, 29, 34, 35, 60-62, 64, 65, 70, 73, and 74 are still being rejected under Ha in view of Fujimori, a different Fujimori reference is being applied.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 7,788,375 to Ogishima et al. and U.S. Patent Publication No. 2003/0133059 to Wei et al. appear to read on the amended claim 1, and provide the contact structure between the first and second electrode added in the most recent amendment.

U.S. Patent No. 7,015,996 to Sakamoto et al. discloses color filter substrates wherein the color filter layer is thinned over the reflection region of the LCD.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd